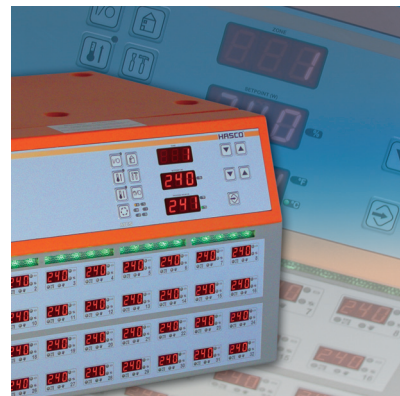










Operating instructions

CE



Multi - hot runner
control unit
Z 1240/...

Z 1240/... with key-display

Outputs ON / OFF			Home – Zones - Group selection
Boost ON / OFF			Parameters (see below)
Standby ON / OFF			Change of operation mode Control – Manual – OFF
Selection total display			Selection total display

	Zone-Parameters
1	L-Alarm
2	H-Alarm
3	dL/dH-Alarm
4	xp (P-value)
5	tn (Integral-part)
6	tv (Differential part)
7	Classification for the zone
8	Operation mode of the zone
9	Monitor-zone
10	Alternative zone
11	Softstart
12	Combined heating
13	Ramp up
14	Ramp down
15	Output rate maximum
16	Output rate nominal
17	Output rate mean
18	Output rate mean nominal
19	Output rate mean tolerance
20	Current nominal
21	Current tolerance
22	Diagnosis time
23	Offset temperature
24	Zero cross / phase control
25	Boost-Offset
26	Standby temperature
27	Auto-Adaption
31	No. of group
32	Leakage current

(4sec)	System-Parameter
SC	Slowest Channel
Pro	Program
d iR	Diagnosis program
b-t	Boost-time
AL	Alarm delay
Adr	Address RS485
bR1	Factor for Baud-Rate "1"
bR2	Factor for Baud-Rate "2"
CRn	CAN-Bus-Address
CH	Combined heating
AP	Auto Power
HH	HH-value
CL	Classification
LC	Leakage current supervision
LCL	Leakage current limit
SSr	Triac supervision
FAH	Fahrenheit indication
br	Overheat brake
StP	Standard parameters
IC	ID Code
IL	ID Level
PC	Power-Control
EP1	Protocol type "1"
EP2	Protocol type "2"
LRS	National language
LI	Voltage line 1
Fr 1	Frequency line 1
...	Frequency 2 and 3

Internal Parameters



Safety hint (see also chapter 8.2.1)

Before connection to the mains supply the ratio of the 3 lines has to be checked against the settings of the controller. Z 1240/... will be delivered for star/Y- or triangle-net referring to the customer's demand.

It does not predict dangerous voltage at the outputs to switch off all outputs or single zones!

The referring plugs or the complete Z 1240/... unit will have to be disconnected from the mains supply before maintenance of the connected heaters!

Disconnect the Z 1240/... unit from the mains supply before opening!

Contents

1 Survey of the units	page
1. 1 Safety hints	.6
1. 2 Type label	.6
1. 3 Features and functions	.7
2 Operation	
2. 1 Menu-keys	.8
2. 2 Indication	.8
2. 3 LED-stripe	.8
2. 4 Settings	.9
2. 5 LED-indicator for the total display	.9
2. 5. 1 Quality of the control	.9
2. 6 Total display in the front	.9
2. 7 Outputs ON/OFF	.9
2. 8 Home-Menu - setpoints	.10
2. 9 Groups	.10
2. 9. 1 Operation of groups	.10
2. 9. 2 Group assembly	.11
2. 9. 3 Sequential Heating	.10
2.10 Operation modes	.11
2.10. 1 Control mode	.11
2.10. 2 Manual mode (Power)	.11
2.10. 3 OFF	.11
2.11 Selection of the total display	.12
2.12 Boost	.12
2.13 Standby	.12
2.14 Settings	.12
2.15 Indications and request via display	.13
2.15. 1 Status of the zone	.13
2.15. 2 Alarms and reasons	.13
2.16 Zone-supervision	.16
2.16. 1 Classification	.16
2.16. 2 Softstart during heating-up	.16
2.16. 3 Leakage current supervision	.16
2.16. 4 Combined heating-up	.17
2.16. 5 Fuse supervision	.17
2.16. 6 Sensor supervision	.17
2.16. 7 Triac supervision	.17
2.16. 8 Output rate supervision	.17
3 Diagnosis program	.17
3. 1 Chose the diagnosis programs	.18
3. 2 Selection of zones	.18
3. 3 Action of the diagnosis program	.18
3. 4 Stop and skip	.18
3. 5 End of diagnosis	.18
3. 6 Failure report of the diagnosis	.19
4 PLUS-unit	.19
4. 1 General settings of the PLUS-unit	.20
4. 2 Start of the PLUS-unit	.20
4. 3 Seperation of the PLUS-unit	.20
4. 4 How to change the PLUS-unit	.20
4. 5 Hint to the PLUS-unit	.20

5 Parameters	page
5. 1 Reset to standard-parameters .....	.21
5. 2 Date and time .....	.21
5. 3 Passwort – IC .....	.21
5. 4 System parameters .....	.22
5. 4. 1 SC-parameter (Slowest Channel) .....	.22
5. 4. 2 Pro-parameter (Program) .....	.22
5. 4. 3 Diagnosis program .....	.22
5. 4. 4 B-t-parameter (Boosttime) .....	.22
5. 4. 5 AL-parameter (Alarm delay) .....	.22
5. 4. 6 Adr-parameter (Address) .....	.22
5. 4. 7 bAu-parameter (Baud-rate 1) .....	.23
5. 4. 8 bA2-parameter (Baud-rate 2) .....	.23
5. 4. 8 CAn-parameter (CAN-Bus Address) .....	.23
5. 4. 9 Ct-parameter (Combined heating) .....	.23
5. 4.10 AP-parameter (Auto Power) .....	.23
5. 4.11 HH-parameter (HH-value) .....	.24
5. 4.12 CL-parameter (Classification) .....	.24
5. 4.13 LC-parameter (Leakage current supervision) .....	.24
5. 4.14 LCL-parameter (Leakage current level) .....	.24
5. 4.15 SSR-parameter .....	.24
5. 4.16 FAH-parameter (Fahrenheit-indication) .....	.25
5. 4.17 Brake-parameter (Overheat-brake) .....	.25
5. 4.18 Std-parameter (Standard parameter) .....	.25
5. 4.19 IC-parameter (ID Code) .....	.25
5. 4.20 IL-parameter (ID Level) .....	.25
5. 4.21 PC-parameter (Power Control) .....	.25
5. 4.23 tP1-parameter (Protokol-type 1) .....	.26
5. 4.24 tP2-parameter (Protokol-type 2) .....	.26
5. 4.25 LAn-parameter (Language) .....	.26
5. 4.22 L1-3-parameter (Line-voltage) .....	.26
5. 4.23 Fr1-3-parameter (Line-frequency) .....	.26
5. 4.24 Date-parameter (date and time) .....	.26
5. 5 Zone parameters .....	.27
5. 5. 1 PARAMETER 1:	
Lo-Alarm .....	.27
5. 5. 2 PARAMETER 2:	
H-Alarm .....	.27
5. 5. 3 PARAMETER 3:	
Deviation .....	.27
5. 5. 4 PARAMETER 4:	
P-gap for heating .....	.27
5. 5. 5 PARAMETER 5:	
I-gap for heating .....	.27
5. 5. 6 PARAMETER 6:	
D-gap for heating .....	.28
5. 5. 7 PARAMETER 7:	
Classification of the zone .....	.28
5. 5. 8 PARAMETER 8:	
Operation mode of the zone .....	.28
5. 5. 9 PARAMETER 9:	
Monitoring channel .....	.28
5. 5.10 PARAMETER 10:	
Alternative channel .....	.28
5. 5.11 PARAMETER 11:	
Softstart .....	.28
5. 5.12 PARAMETER 12:	
Combined heating .....	.29
5. 5.13 PARAMETER 13:	
Ramp up .....	.29
5. 5.14 PARAMETER 14:	
Ramp down .....	.29
5. 5.15 PARAMETER 15:	
Output rate maximum .....	.29
5. 5.16 PARAMETER 16:	
Output rate nominal .....	.29

5. 5.17	PARAMETER 17:	Seite
	Output rate mean	.29
5. 5.18	PARAMETER 18:	
	Output rate mean nominal	.29
5. 5.19	PARAMETER 19:	
	Output rate mean tolerance	.30
5. 5.20	PARAMETER 20:	
	Current nominal	.30
5. 5.21	PARAMETER 21:	
	Current tolerance	.30
5. 5.22	PARAMETER 22:	
	Diagnosis time	.30
5. 5.23	PARAMETER 23:	
	Offset temperature	.30
5. 5.24	PARAMETER 24:	
	Zero cross / phase control	.30
5. 5.25	PARAMETER 25:	
	Boost offset	.30
5. 5.26	PARAMETER 26:	
	Standby temperature	.31
5. 5.27	PARAMETER 27:	
	Auto-adaption	.31
5. 5.28	PARAMETER 28-30:	
	Reserve	.31
5. 5.29	PARAMETER 31:	
	Group number 1-8	.31
5. 5.30	PARAMETER 32:	
	Leakage current	.31

6 Configuration of the unit

6. 1	Commissioning	.31
6. 1. 1	Dip-switch	.31
6. 1. 2	Jumper	.32
6. 1. 3	Connection	.32
6. 1. 5	Heat-up	.32
6. 1. 6	Finalisation	.32

7 Technology

7. 1	Cable carrier	.33
7. 2	Document case	.33
7. 3	Power fuses	.33
7. 4	Protection against net-voltage	.33
7. 5	Rear side	.33
7. 5. 1	Digital inputs	.34
7. 5. 2	Warning- and alarm-contacts	.35
7. 5. 3	Interface socket	.35
7. 5. 4	Signal-light socket	.35
7. 5. 5	Power supply socket	.35
7. 5. 6	Pin assignment	.36
7. 6	Controllers	.36
7. 6. 1	Control units 36 x 16 - 96 x 16	.36
7. 6. 2	Control units 2 x 16 - 32 x 16	.36

8 Technical data .37

8. 1	Hints to EMV	.38
8. 2	Delta net	.38
8. 2. 1	Safety hint	.38

9 Transport (from Z 1240/... 36) .39

Declaration of EC-Conformity

1 Survey of the units

The units of the series Z 1240/... are based on two variations. 8-, 16- or 32-zone controllers are designed for table use, 64-, 96- or 128-zone cabinets are fitted with wheels.



Main switch in the front
Control unit size 36 x 16 - 96 x 16



Main switch on the rear side
Control unit size 2 x 16 - 24 x 16

1.1 Safety hints

The Z 1240/... units have to be connected to the specified mains supply. The local and the general rules have to be observed for the installation and operation.

The units have to be wired and commissioned by authorised persons.

Maker and vendor of the unit are not liable for direct and indirect damage or loss due to wrong handling.

**It does not predict dangerous voltage at the outputs to switch off all outputs or single zones!
The referring plugs or the complete Z 1240/... have to be disconnected from the mains supply,
before working at the connected heating elements!
Disconnect the Z 1240/... unit from the mains supply before opening!**

1.2 Type label

The type label is bound on the right hand side of the controller. It indicates the type with the number of zones, the data for the electrical connection and maker's information.

Typ: Z 1240/64 x 16 MCS64	
Ser.-Nr. 12009	Bj:45/09
Netzanschluss: •Y 230/400 VAC •50 Hz	
Δ115/230 VAC 60 Hz	
3x63 A	
Schutzklasse: IP 20	
Thermofühler: Fe-CuNi Typ J	
Made in Germany	CE
HASCO®	www.hasco.com

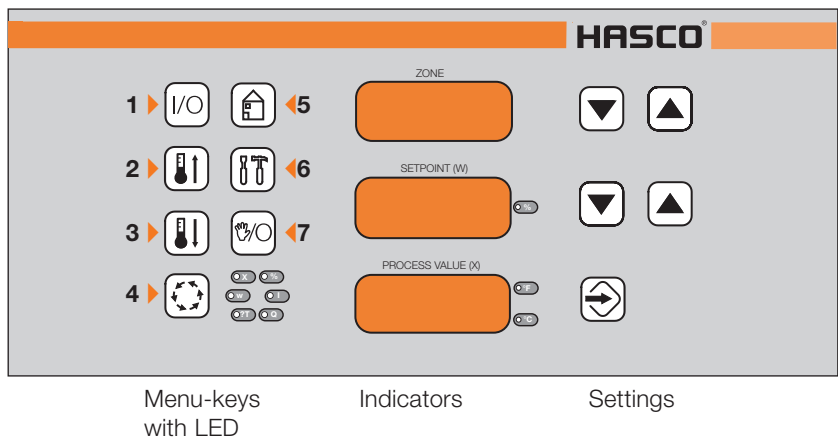
1.3 Features and functions

All units include the same functions which are described in the following:

- Total display for all zones
Selectable indication for all zones with single failure messages.
- LED-stripe for permanent signalling
A 270° around LED-stripe indicates 3 status of supervision to see from far away.
- Control loop identification by classification
The controller recognises slow from very fast zones by itself.
- Softstart for hot runners
Cold zones will be heated carefully.
- Combined heating
All zones will wait for the slowest channel to heat up.
- Boost-function
Increase of temperatures of groups or single zones for set times.
- Standby-function
Decrease of temperature to a set value.
- Auto-Power-function
This zone will change to manual mode in case of broken sensor / thermocouple.
- 8 groups of zones
Individual groups may be recorded for collective changes and settings.
- 6 Programs with setpoints and zone parameters
A certain profile may be accessed by external digital signal.
- Current measuring and supervision
The heater currents are measured for each zone and may be supervised.
- Leakage current supervision with fast dry-out
In case of leakage current the setpoint of all zones might be reduced to 100°C/212°F.
- Monitor-zones
Individual zones can be used just for indication and supervision.
- Supervision of output rate against entered values.
- Net-voltage protection for the sensor inputs
High voltage at the sensor inputs will blow the referring fuses.
- Puls-package or phasecut control
The outputs may be controlled in both ways or in a mix of these.
- Sensor control
Broken sensor / thermocouple or reversal polarity will be detected and indicated.
- Fuse control
A blown heater fuse will be detected and indicate by LED.
- Triac control
A defective triac will be detected and indicated by LED.
- Control quality
The control quality may be observed for each zone during the process.
- Interface for computers
Useful for protocols (important for ISO 9000), remote operation and supervision.
- PLUS-unit
Several controllers operate as a single unit via CAN-bus interface.
- Quality
There is a sensible interpretation of all zones available.
- Diagnosis
All zones can be checked by diagnosis program.
- Sequential heating
Selections of zones may be heated in sequence one after another.

2 Operation

The operation display in the top has keys, indicators and LED-stripe.



2.1 Menu-keys

The menu-keys activate a function or select a menu for operation by the setting-keys. The referring LED besides the menu-key indicates the selected function.

Key	Function	Indication	
1	Outputs ON/OFF	ON	Outputs active/disabled
2	Boost ON/OFF	ON	Temperature increase
3	Standby ON/OFF	ON	Temperature decrease
4	Process view	ON referring to selection	X, W, X-W, Q, I, %
5	Home-menu		Return to zone 1
6	Parameters		System-, zone-param.
7	Operation mode		PID – Hand – AUS

2.2 Indication

The control indication is composed of three indicators:



the number of the zone (here 128)



the setpoint of the zone (here 230)
with additional LED for manual mode



the actual value of the zone (here 229)
with status (failure)
with additional LEDs for the selected temperature-indication

2.3 LED-stripe

A three sided LED-Band signals three possible states of supervision. The changes happen synchronous with the dry alarm-contacts (see alarm-contacts). The reaction may be delayed if required (see **AL**-parameter). The indications of the zones will never be delayed.



Green = OK / flashes during classification
Yellow = Warning
Red = Alarm

2.4 Settings

ZONE
128

SETPOINT (W)
230

PROCESS VALUE (X)
229

The keys beside the zone number select the zone or the parameter.

The keys beside the setpoint set the value for the setpoint or the parameter.

Each flashing value has to be confirmed by the Enter-key.

2.5 LED-indicator for the total display

The LEDs indicate the selection for the total display:

Actual value	[°C / °F]	X	%	Output rate	[%]
Setpoint	[°C / °F]	W	I	Current	[A]
Deviation	[K]	T	Q	Quality	[%]

2.5.1 Quality of the control

The selection of the quality in the total display opens the information about the quality of all control loops. This is more sensible than the deviation ΔT . The interpretation is calculated by the Root Mean Square of the last 10 seconds in %.

100% correspond with a deviation $<0,1K$.

Each 1% deviation from 100% corresponds with a deviation of $0,15K / 0,27^{\circ}F$ from the setpoint.

2.6 Total display in the front

The indication in the total display may be selected for all zones. Additional information is available by the referring LEDs.

229 1 2 3 4

↑ ✱ Cursor

↑ ✱ manual mode

Blasted fuse
Triac-defect

The cursor indicates the actually operated zone. These might be several, when groups are selected. This indication flashes to indicate selected monitor-zones. Monitor-zones are not part of groups.

2.7 Outputs ON/OFF



The ON/OFF key enables or disables all outputs. The status ON will be indicated by the green LED. The outputs have to be switched ON after each start.

Plug in or out should only happen, when outputs are disabled!

To enable outputs may be disabled by the digital input No.5 (see Dip-switch).

Leakage current $>300mA$ inhibit to switch ON! (see parameter 32)

Disabled outputs are not without voltage!

2.8 Home-menu - setpoints

	The menu-key returns from any level to zone 1.
<div>ZONE</div>	<div></div> <div></div> The keys beside increase the number of the zone for selection. This zone will be indicated in the total display by a LED like a cursor.
<div>SETPOINT (W)</div>	<div></div> <div></div> The keys beside the setpoint indicator select a setpoint value. The range is from a disabled zone „- - -“ to the HI-value (see HI-parameter). The upper limit is preset by the HH-value (see HH -parameter).

2.9 Groups

To operate via groups, these have to be defined before.

It simplifies all further settings and operation to define and configure the groups before. This separates the nozzles from manifolds or different components from one another. The real advantage is the common operation. All settings are available for groups in the same way as single zones: setpoints, operation mode, parameters, boost, standby.

The assembly of groups has to be set via zone-parameter 31. Important hints are to find among **Installation of groups**.

2.9.1 Operation of groups

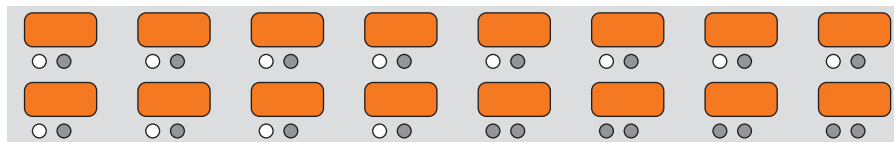
<div>PROCESS VALUE (X)</div>	<div></div> <div></div>	The keys beside the zone number select the groups below zone 1. Here: group 1 The zones of the group are indicated in the total display by the LED for the operated zones. A group may be operated just like a single zone: setpoint , operation mode, zone-parameters, boost, standby. The assembly of the groups has to be set by the zone-parameter 31.
→ mit Cursor LEDs		
<div>ZONE</div>	<div></div> <div></div>	There is a selection of all zones available below group 8. This is independent of the groups.
<div>PROCESS VALUE (X)</div>		This indicates that there is no zone belonging to the referring group or the setpoints, output rates or operation modes are different within this group. In case of different operation modes there are no settings for parameters available.
<div>PROCESS VALUE (X)</div>	Input: 0...600°C 32...999°C	The input of setpoints for a group is always relative . I.e. the input is the deviation of the actual setpoint.
<div>PROCESS VALUE (X)</div>	Input: -99...100%	The input of values for the output rate of a group is always relative . I.e. the input is the deviation of the actual rate.

The values for the **zone-parameters** of the groups are to set **absolute**. The indication is always “0”, also after the input.

2.9.2 Group assembly

The assignment of each zone to a group is made by the parameter 31. If the assignment begins with the biggest group, all zones may be set easily to this group by **ALL**. Only the remaining zones have to be changed to the referring groups by parameter 31 one after another.

The contents of a group may be checked by the selection of the group in the total display.



Example:

Markings of a group of 12 zones

2.9.3 Sequential heating

Parameter 12 enables heating sequences that follow one another. A sequence consists of one or multiple zones. Before a sequence starts heating the previous one must have reached a difference of $-10K$ below the setpoints.

The order of the sequence is always started from 8 and finishes at 1. The settings for these sequences should be entered after the selection of groups, as the selection might be taken over. (see parameter 12)

2.10 Operation modes



This key changes the operation mode for the selected zone or group among

Control mode – Manual mode – OFF

→ with  LED at manual mode

Manual mode will be indicated by the LEDs.
The indicators stay dark in the mode OFF.

In case of group-operation the indication of the total display changes to setpoint or output rate by itself. Each zone may run reduced operation mode by parameter 9.

- The zone is used for simple temperature indication (monitor), if no outputs are available or no heater is connected.
- This is a special mode of a zone without installed inputs or without sensors (manual Power-mode).

But a connected sensor enables a control-mode, which requires a confirmation of the output rate after change to manual mode. (see Auto-Power **AP**).

2.10.1 Control mode



The setpoint will be indicated and may be changed.

In case of Auto-Power function the zone changes immediately to manual mode.

In case of group-operation the indication of the total display changes to setpoint by itself.

This is not possible in manual mode or Auto-Power without sensor.

2.10.2 Manual mode (Power)



→ with ☼ LED at manual mode

P flashes alternating with the actual output rate. The % LED lights.

The LED in the total display indicates the manual mode.

The change to the manual mode proposes the last value that was used for the manual mode (Parameter 16). If there is still a sensor connected, the temperature supervisions **L**, **H**, **HH** as well as the deviations **dL** und **dH** are still active.

In case of group-operation the indication of the total display changes to output rate by itself.

The system-parameter **PC** may adjust constant rates to constant power output within fluctuating net voltage.

This is not possible for Monitor-zones.

2.10.3 OFF



The zone will be turned off without losing the settings.

The total display stays dark.

If there is still a sensor connected, the temperature and triac supervisions **-H-**, **HH** as well as **-S-** are still active, when the setpoints are > 0°.

2.11 Selection of the total display



This key changes the indicators of the total display.

There are available

Actual values – setpoints – deviations from the setpoint
Output rate[%] – current[A] – control quality

and will be indicated by the referring LED.

The LED for additional information in the total display is independent of this selection.

2.12 Boost



2 seconds

all by ☼ Cursor-LED marked zones

When outputs are switched ON, the Boost-key increases the temperature of the selected zone or group for a short time. The status will be indicated by the integrated LED.

The additional setpoint has to be set by zone-parameter 25, the time by the system parameter **b-t**.

2.13 Standby



2 seconds

all zones

When outputs are switched ON, the Standby-key sets all setpoints to a lower setpoint (zone-parameter 26). The status will be indicated by the integrated LED.

Standby will also be finished by this key.

2.14 Settings



The parameter-key open the entry to all parameters.

→ Zone-parameters → 4 seconds → System parameters

2.15 Indications and request via display

2.15.1 Status of the zone

<div>ZONE</div> <div>128</div>	<p>The decimal point in the zone number indicates the coldest zone during combined heating stage. (see SC-Parameter)</p>
<div>SETPOINT (W)</div> <div>P</div>	<div>SETPOINT (W)</div> <div>27</div> <p>P = manual mode alternates with the output rate (here 27%)</p>
<div>SETPOINT (W)</div> <div>OFF</div>	<p>Zone is turned off.</p>
<div>SETPOINT (W)</div> <div>P = P</div>	<p>P = manual mode The output rate has to be set and confirmed.</p>
<div>SETPOINT (W)</div> <div>ACP</div>	<p>AC = Alternative Channel with Auto-Power AP = 4 The number of the zone has to be set and confirmed.</p>
<div>SETPOINT (W)</div> <div>AC</div>	<div>SETPOINT (W)</div> <div>104</div> <p>AC = Alternative Channel with Auto-Power AP = 4 alternates with the number of the linked zone (here 104).</p>
<div>SETPOINT (W)</div> <div>ICP</div>	<p>IC = Identification-Code The correct password has to be set and confirmed to unlock the settings.</p>
<div>SETPOINT (W)</div> <div>n = P</div>	<p>n = Total of zones of a PLUS-unit The indicated sum has to be confirmed.</p>
<div>PROCESS VALUE (X)</div> <div>n 2</div>	<p>This indication shows, that the controller is Slave 2 (CAN-address = 3) within a PLUS-unit.</p> <p>(see PLUS-unit)</p>

2.15.2 Alarms and reasons

When the LED-stripe changes to yellow or red, the of the referring zone indicates the type of alarm.
The indicator for the actual value as well as the total display show the alarm alternating with the value.

<div>● ● ● ● ● ● ● ●</div>	<p>Conversion °C - °F</p>
<div>C -</div> <div>-F</div>	<p>The time for conversion of all programs and parameters may take some minutes during the re-start after the change.</p>
<div>● ● ● ● ● ● ● ●</div>	<p>Sensor-failure</p>
<div>-5 -</div> <div>-EE</div>	<p>This sensor has a failure. In case of mixed polarity the main relay will trip at -15°C/5°F and can only restart after OFF/ON.</p> <p>Temperatures too low, < -15°C/5°F are indicated like display overflow.</p>
<p>→ Reason:</p>	<ul style="list-style-type: none"> ■ Temperature < -15°C? ■ Polarity +/- of the thermocouple mixed up at the terminal points?



Broken sensor



There is no input signal from the sensor.

- **Reason:**
- Sensor connected?
 - Sensor wiring OK?
 - Sensor plugs OK?
 - Check the NSS-fuses inside the unit
 - No Auto-Power function, AP = 0



HH-Alarm



This actual value is above the **HH**-parameter. All outputs get switched off. The controller will go on heating only after restart when the actual value has decreased the **HH**-parameter.

→ Not for monitor-zones!

- **Reason:**
- Setpoint too close to the **HH**-value?
 - Heating externality?
 - Triac defective?



H-Alarm



This actual value is above the **H**-alarm (parameter 2). All outputs get switched off until the actual value decreases below the **H**-alarm.

- **Reason:**
- Alarm limit too close to the setpoint?
 - Heating externality?
 - Triac defective?



Current-alarm with Triac-LED



with ☼ LED for Triac-failure

Current flows without any output rate (0%).

- **Reason:**
- Triac defective, it is permanently closed!

Depending on the setting of the system parameter **SSr** the alarm-contact changes and the main relay turns OFF together with all heaters. The controller will be ready after restart and replace of the triac

**Z 1240/2 x 16
to Z 1240/16 x 16**

These controllers indicate the concerned zones as well as all other zones with identical power.

- **Solving:**
1. Take out the fuses of the concerned zones.
 2. Turn the controller OFF/ON.
 3. Insert the fuses one after another until this indication appears again.
This zone has the defective triac.
 4. Repeat the sequence in case of several defective triacs.

→ **Disconnect from the mains supply before opening!**



Current-alarm with fuse-LED



with ☼ LED for fuses

No current while output rate >0%.

- **Reason:**
- Fuse defective?
 - Cable or connectors defective?
 - Heater defective?
 - Triac defective, not closing?


U-Alarm


No line-voltage for these zones detected.
See parameter L1-L3, or F1-F3

- **Reason:**
- Mains supply interrupted?
 - Internal upstream fuse blown?
 - Z 1240/ 2x16 - Z 1240/16x16: 3 fuses on the controlboard
 - Z 1240/24x16 - Z 1240/96x16: 6 fuses in the terminal bloc


L-Alarm


This actual value is below the **Lo**-alarm. (see parameter 1)

- **Reason:**
- Alarm limit too close to the setpoint?
 - Heating power sufficient?
 - Heater defective?
 - Sensor without contact to this zone?
 - Defective output board in the unit?
 - Sensor polarity mixed?


LC-Alarm

(red)



**Z 1240/2x16
to Z 1240/16x16**

The line of this zone has a leakage current, it might dry out at 100°C.
The reaction depends on settings the **LCL** parameter.

These controllers will indicate the leakage current of the concerned zones.

- **Reason:**
- The heater must dry out to avoid damages.
 - Isolation between heater and PE defective?


d I-Alarm


ohne LED
Sicherung/Triac

The current is out of supervision tolerance.

- **Reason:**
- Heater defective or partial failed?
 - Nominal current (parameter 20) correct?
 - Tolerance (parameter 21) too small?


dY-Alarm


Deviation of the output rate-supervision is out of tolerance.

- → **Reason:**
- Defective hotrunner system?
 - Condition and age of the heaters?
 - Values of output rate (parameter 18) not correct?
 - Tolerances too small (parameter 19)?


negative temperature deviation


This actual value is below the deviation alarm (parameter 3).

- **Reason:**
- Heating power sufficient?
 - Heater defective?
 - Classification passed?
 - Sensor without contact to this zone?
 - Defective output board in the unit?
 - Deviation alarm (Parameter 3) too small?



positive temperature deviation



This actual value is above the deviation alarm (parameter 3).

- **Reason:**
- Increase deviation alarm (Parameter 3)
 - Classification passed?



Total display W-X Difference >- 99K

The total display cannot indicate this value.



Total display X Actual value < -15°C

- Temperature too low?
- Polarity mixed, temperature decreases during heating?



Plus-unit without complete connection



This indication has to be confirmed at the master of a PLUS-unit, after it is rebuilt completely.

There is no power output during this indication.



- **Reason:**
- CAN-Bus disconnected?
 - CAN-Bus missing the termination plug?
 - One controller turned OFF?
 - Assembly of the PLUS-unit was changed?

2.16 Zone-supervision

2.16.1 Classification

After switching ON the outputs, the controller runs a classification. The results overwrite the settings for P, I and D-, even manual settings if the classification differs from the last one.



The procedure will be indicated by the flashing green LED-stripe. It may need up to 90seconds for inert big components.

The classification may be disabled by the **CL**-parameter, to save special settings of the **P**, **I** and **D** parameters. The range for the start of the classification procedure is 350°C/662°F but at least 30°C/86°F below the setpoint.

2.16.2 Softstart during heating-up

The correct running for hotrunner systems is a slow heating-up at low temperatures with low output rates. The Z 1240/... controllers are fitted with a special softstart routine. This allows a smooth but efficient heating up. The function can be disabled by zone parameter 11.

Leakage current supervision



The supervision of leakage current registers leakage current from a specified value (LC-parameter). As soon as the measuring exceeds this value the actual temperature value alternates with the indication **LC**.

The indication disappears only 10seconds after falling below the limit.

**After plugging or unplugging of heater connectors
LC may appear for a very short moment!**

If the setpoints are above 100°C the controller will dry out the hotrunner referring to the setting of the LCL-parameter. The controller will keep the zones at 100°C/212°F until the LC disappears and the possible humidity has vaporised. (see **LCL**-parameter)

2.16.4 Combined heating-up

The combined heating shall avoid a thermal asymmetric load due to slower and faster zones. Synchronous heating of all zones takes care of the tool and prevents mechanical tension and early failure.

All zones will be restricted in a certain temperature difference among each other (**Ct**-parameter) for synchronous heating. Only the slowest zone will run by maximum rate.

The others will be limited to go ahead with the preset temperature difference. The controller is looking for the coldest zone during heat up (see **SC**-parameter).



The **SC**-parameter indicates „0“ if no combined heating is active.

During the active stage the number of the slowest channel / coldest zone will be indicated here.

The combined heating is working even during sequential heating.

2.16.5 Fuse supervision

The fuse supervision detects blown fuses. There is no current, when the controller sets the referring output. Defective heaters or wiring will result in the same indication.

2.16.6 Sensor supervision

The controller detects missing or broken sensors. The actual value will be set to „-E-“. This zone may go on by the Auto-Power with restricted function.

Mixed polarity decreases the indication down to „-EE“ and switches the controller off until restart.

2.16.7 Triac supervision

The triac supervision detects defective triacs, as there is a current, without the controller has set the referring output.

2.16.8 Output rate-supervision

The supervision of the output rate helps to detect non regular conditions in the heater system. After activation the actual mean rate (parameter 17) will be compared to an individual nominal setting for the output rate (parameter 18). In case of deviations greater than the tolerance (parameter 19) the controller will indicate **dY** for the referring zone.

The setting „0“ and the period of heating-up (no mean values available) disable the supervision.

3 Diagnosis program

Z1240/... is fit with a diagnosis program to check sensors and heaters. This program is especially to use after first installation or after service. As described in the following you have to choose the program, select the zones and start.

There are single zones, a group of zones or all zones available for one routine. The stage runs without operation.

The diagnosis program recovers:

- Mixed sensors or heaters
- Wrong polarisation of sensors
- Shorted sensors.

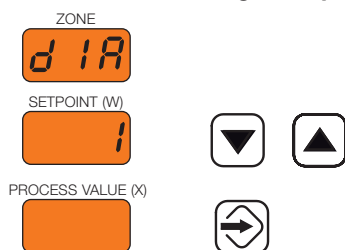
As this function supervises the condition of the heaters (a certain increase of temperature is required during a certain time), it is helpful to use the diagnosis program also, when irregularities occur during normal operation. The period of supervision will be set by the program itself. It may be preset by the parameter 22 to heat up extreme control loops for 5°.

Selected zones will not be checked

- if the setpoint = 0,
- if no sensor is recognised -E-,
- if the zone is turned OFF.

During the diagnosis all zones with a sensor, even from the selection excluded zones, will be supervised by the diagnosis.

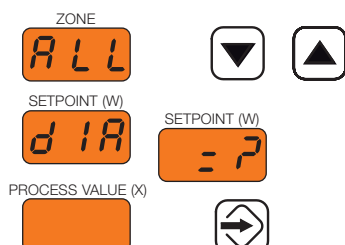
3.1 Chose the diagnosis program



The diagnosis program will be started by the setting of „1“ in this parameter.

The confirmation changes directly to the selection of the zones.

3.2 Selection of zones



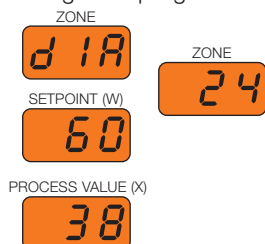
There are single zones, a previously collected group of zones or all zones available for this routine.

This alternating indication shows, that the diagnosis does not run.

Start of the diagnosis program.

3.3 Action of the diagnosis program

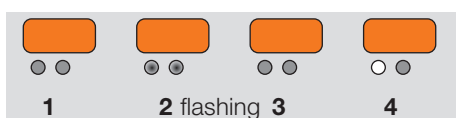
The diagnosis program runs automatically through the selected zones and may be observed in the display.



This section indicates the actually powered zone (here zone No. 24).

This section shows the countdown for the actual zone.
Just this zone has to heat up for 5° during this time.

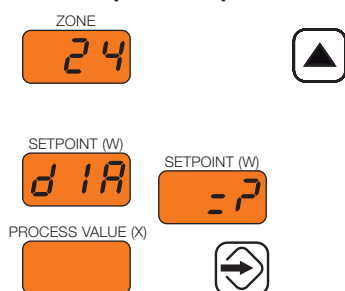
This section indicates the actual temperature of this zone.



Examples:

1. Zone ready or not checked
2. Zone diagnosis in manual mode
3. Zone not selected
4. Zone selected, waiting for diagnosis

3.4 Stop and skip



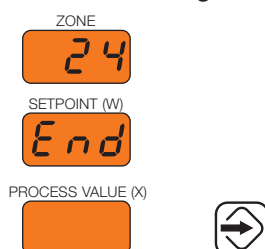
Besides the indicated zone the up-key may jump to the next zone of the selection. Skipped zones are treated as correct. This may be used when the diagnosis has to be repeated.

The repeat of passed zones is only possible by restart of the routine.

This alternating indication shows that the diagnosis does not run.

Stop / Start of the referring zone. The countdown restarts with each start.
This manipulation may help to increase the temperature for 5° at inert zones.

3.5 End of Diagnosis



The routine was finished without fault.

Confirms the diagnosis program and resets all operation modes.

3.6 Failure report of the diagnosis

The program stops with the first detected failure.

ZONE
24

Failure report 1

SETPOINT (W) H SETPOINT (W) 24

The routine was stopped by a failure.
The actual zone was not able to heat up sufficiently during the countdown.

- Reason:
- Diagnosis time too short?
 - Sensor in wrong position?
 - Sensor cable shorted?
 - Heater defective?

Failure report 2

SETPOINT (W) H SETPOINT (W) 68

The routine was stopped by a failure.
The output of the actual zone has heated up the sensor of this zone.
The cursor-Led of both zones are flashing.

- Reason:
- Mixed wiring?
 - Sensor in wrong position?
 - Connectors mixed?

Failure report 3

At the total display

SETPOINT (W) 1 SETPOINT (W) 0

mit der LED für die Sicherung

The routine was stopped by a failure.
The output of the actual zone does not lead any current.
This zone may be skipped by the up-key.

- Reason:
- No heater connected?
 - Fuse blown?
 - Cable defective?

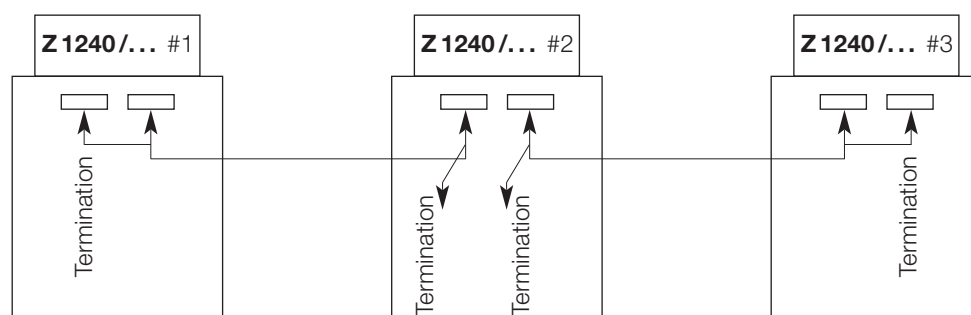
I/O

2 seconds

The end of the diagnosis routine has to be confirmed by the On/Off or Enter-key.
The operation modes will get reset.
After solving the failure, the routine should be started again. Zones which are correct, may be skipped.

4.3 PLUS-unit

A PLUS-unit consists of multiple controllers which may be collected to one unit by a CAN-Bus interface. The connection happens by an interface cable with termination plugs at both ends. The proper function of the CAN-Bus requires the connection of both plugs at the rear side of the controllers. The cable has to be connected directly and the remaining plug must be covered by a further cable or by the termination plug.



The operation is always enabled by unit #1 = master.

Examples

with 3 controllers:

Z 1240/... #1		Z 1240/... #2		Z 1240/... #3
10 zones		60 zones		30 zones
1	CAN-Address	2...31	CAN-Address	3...32
1	e.g.	2	e.g.	3
		3		5
		10		20
		31		32

The CAN-address 1 activates the master-display operation for all the connected control zones. All function are available from here.

The connected controllers "slaves" need a different increased CAN-address from 2 to 32. The operation is reduced to ON/OFF and the selection of the total display.

Functions as groups, sequential combined heating, warning and alarm, parameters or Auto-Power are available at a PLUS-unit in the same way as at a single unit.

4.1 General settings of the PLUS-unit

The CAN-address has to be set before the connection with another unit.

Therefore the BUS-cable may be disconnected or the other units have to be turned off.

After setting the CAN-address the controller must be restarted.

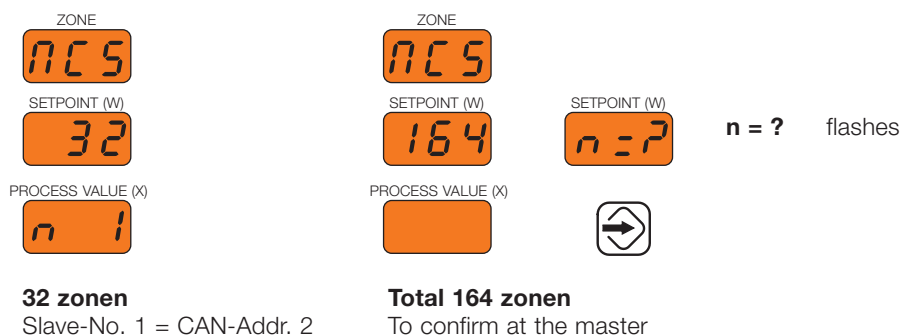
The available number of zones flashes and has to be confirmed.

4.2 Start of the PLUS-unit

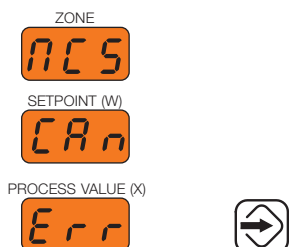
After all controllers are connected and turned on the total number of zones has to be confirmed at the master.

The slaves indicate only the number of zones and the slave-No. This No. results from the CAN-address (-1) and fixes the sequence of the slaves.

Example:



4.3 Separation of the PLUS-unit



After one or more controllers of this PLUS-unit have been disconnected or turned off, the system has to be confirmed by the master, when it is completed.

For identification of the master **Err** flashes.

4.4 How to change the PLUS-unit

A change of the PLUS-unit results from

- Change of the total of zones
- Change of the number of controllers
- Change of the sequence of the slaves
- Any change of address at the slaves.

The following start is equal to the start of a new PLUS-unit.

4.5 Hint to the PLUS-unit

All changes of the constellation of a PLUS-unit will automatically delete the settings for the Alternative Channel Auto-Power **AP=4** to avoid wrong constellations.

The digital inputs are only available via the master for all controllers.

5 Parameters

The default settings of the parameters are sufficient for general control requirements. Customer's individual setpoints, alarm limits, operation modes etc. have to be set referring to the task.

5.1 Reset to standard-parameters



Indication: 0 - 128 A reset to default settings can be activated by the system parameter **StP**.

Reloading standard parameters overwrites all settings by the default values.

The LED-stripe is flashing during this procedure.

PLUS-units have to be separated for reset.

5.2 Date and time

See System parameters \ Date-Parameter

5.3 Password – IC

The controller is protected against unauthorised settings by the identification code "IC". The default code "22" unlocks the settings. This code may be changed from 0...999 by the IC-parameter.

The code will be retrieved by **IC?** has to be set and confirmed to unlock.

There are 3 levels to lock the unit. These are available by setting the **IL**-parameter.

- 1** = total locking: no settings possible without code
- 2** = partial locking: available are ON, setpoints, output rates, boost, standby, change of operation mode, change of programs and setting for **AC?**.
- 3** = no locking: all settings are available.

5.4

These parameters may be used for operation of the Z 1240/... unit. The settings refer to all zones.

The entry will be opened by the parameter-key.

> 4 seconds



Pressing the parameter-key for 4 seconds opens the entry to the system parameters. This passes the zone-parameters.



Further parameters will be reached by the down-key.

5.4.1 SC-parameter (Slowest Channel)



Indication: 0 - 128

This parameter indicates the slowest channel / zone during combined heating. (see **Ct**-parameter)

5.4.2 Pro-parameter (Program)



The Pro-parameter selects one of the 6 programs. Change of the program changes the setpoints and zone-parameters of all zones.

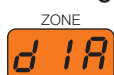


Setpoints and parameters have to be set in the activated program and will be stored directly. They are always available with the referring program.

→ ID-Level: 2
Input limits: 1...6
Default value: 1

The program is not enabled as long as the number flashes in the display.

5.4.3 Diagnosis program



The diagnosis program will be started by the setting of „1“ in this parameter. The selection of zone or group will follow before the diagnosis starts.

→ ID-Level: 2
Input limits: 0...1
Default value: 0

(see diagnosis program)

5.4.4 B-t-parameter (Boost-time)



This parameter sets the time for the increase of temperature. The value of temperature has to be set in parameter 25.

→ ID-Level: 2
Input limits: 0...600 s
Default value: 60 s

The boost mode has to be started by the boost-key.

5.4.5 AL-parameter (Alarm delay)



When an alarm occurs at a zone, the activation of the LED-stripe and the relay contacts may be delayed for a certain time. The setting of „0“ activates the alarms immediately without delay.

→ ID-Level: 2
Input limits: 0...60 s
Default value: 0 s

Other values in seconds cause a delay time.

5.4.6 AAdr-parameter (Address)



An interface RS485 is part of the basic equipment of the Z 1240/... units.

Up to 32 units may be controlled together via the bus. To communicate with the units it is necessary to define an address for each unit.

→ ID-Level: 2
Input limits: 1...32
Default value: 1

Take care, that two units will never get the same address. Otherwise an undisturbed communication will not be possible.

A PLUS-unit sets all following addresses by the master.

For operation with the monitor the first address has to be „1“.

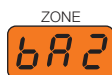
5.4.7 bAu-parameter (Baud-rate 1)



This parameter sets the baud rate for the transmission via interface RS485.

→ ID-Level:	2	1 = 9.600 baud	4 = 57.600 baud
Input limits:	1...5	2 = 19.200 baud	5 = 115.200 baud
Default value:	2	3 = 38.400 baud	

5.4.8 bA2-Parameter (Baud-rate 2)



This parameter sets the baud rate for the transmission via interface RS485-2.

→ ID-Level:	2	1 = 9.600 baud	4 = 57.600 baud
Input limits:	1...5	2 = 19.200 baud	5 = 115.200 baud
Default value:	2	3 = 38.400 baud	

5.4.9 CAn-parameter (CAN-Bus Address)



To enable a CAN-Bus interface for several controllers for a PLUS-unit different addresses have to be set here.

→ ID-Level:	2		
Input limits:	1...32	1:	This controller is the master with operation for all linked controllers.
Default value:	1	2 - 32:	These controllers will be indicated as slave (n) 1-31 in a PLUS-unit.

See also PLUS-unit.

5.4.10 Ct-parameter (Combined heating)



The maximum temperature difference to the slowest zone may be defined here for the combined heating.

→ ID-Level:	2	The combined heating may be switched off for each zone separately by parameter 13.
Input limits:	1°C/32°F	
	...100°C	
Default value:	25°C/45°F	See combined heating.

5.4.11 AP-parameter (Auto-Power)



The **AP**-parameter cancels the selection of output rate, when the manual mode is activated by a broken sensor.

→ ID-Level:	2	
Input limits:	0...4	AP = 0 : output rate = 0% , when the sensor is broken. The zone remains in control mode and switches the outputs off.
Default value:	0	AP = 1 : output rate = mean output rate , when the sensor is broken. This zone changes to manual mode.

The **mean output rate** (parameter 17) will be indicated.
This proposal has to be confirmed by the Enter-key.

This indication asks for the output rate, if no mean rate (parameter 17) has been calculated before.

- AP = 2 : output rate = mean output rate** (parameter 17), like AP=1 without confirmation by the Enter-key.
- AP = 3 : output rate = preset rate** (parameter 16), without confirmation by the Enter-key.
- AP = 4 : output rate = alternative-%**, offers the input of a similar zone, which will run this zone synchronously.

The flashing indication **"AC?"** asks for the input of the alternative channel / zone. The input will be stored in parameter 10 and will be used for the next time without asking.
It is possible, that several zones are linked to the same alternative zone.

For AP = 2, 3 and 4 (when the AC was preset) the zone changes directly to manual mode, when the sensor is broken. The confirmation by the operator is not required.
When the sensor has been returned, the operation mode has to be changed to the control mode.
AP = 1, 2 and 3 offer a constant output rate.



ATTENTION

It is important to note that the temperature is **not** controlled, when the sensor is broken!
When a constant output rate is set, external conditions may change the actual temperature of the zone.
The manual mode is defined for emergency operation to keep the process temporary running.
The defective sensor should be replaced as soon as possible.

5.4.12 HH-parameter (HH-value)



→ ID-Level: 2
Input limits: 1...600°C/
999°F
Default value: 500°C/
932°F

The **HH**-parameter (**HH**-value) sets the upper temperature limit of the unit. Overriding of the HH-value activates the **HH**-alarm. **HH** appears in the display and the main relay switches off. All outputs will turn off.

The controller may go on heating only after restart when the actual value has decreased the **HH**-parameter.

If the **HH**-parameter should be set below any setpoint, so will these setpoints increase with the **HH**-value.

5.4.13 CL-parameter (classification)



→ ID-Level: 2
Input limits: 0, 1
Default value: 1 = ON

This parameter selects the classification. The classification will be passed directly after the start and creates new settings for **P**, **I** and **D**. Even manual settings may get lost when the conditions have changed meanwhile.

To save special settings, the classification must be switched off = "0".

5.4.14 LC-parameter (Leakage current supervision)



→ ID-Level: 2
Input limits: 10...
300 mA
Default value: 120 mA

The limit for indication of leakage current has to be set here. It will be measured by the sum per line.

**After plugging or unplugging of heater connectors
LC may appear for a very short moment!**

Z 1240 / 2 x 16 to Z 1240 / 16 x 16 Provide measuring and supervision per zone.
from size Z 1240 / 20 x 128 Provide measuring and supervision per line.

5.4.15 LCL-parameter (Leakage current level)



→ ID-Level: 2
Input limits: 0...4
Default value: 3

The reaction in case of leakage current may be selected by this parameter.

- 0 = disabled, no measuring
- 1 = indicates **LC** by warning
- 2 = indicates **LC** by alarm
- 3 = indicates **LC** by warning and dries all zones at 100°C/212°F.
- 4 = indicates **LC** by alarm and dries all zones at 100°C/212°F.
- 5 = indicates **LC** by warning and dries only this zone at 100°C/212°F.
- 6 = indicates **LC** by alarm and dries only this zone at 100°C/212°F.

Dry out will only be activated during heat-up below 100°C/212°F.

5.4.16 SSR-parameter



→ ID-Level: 2
Input limits: 0...2
Default value: 2

This parameter selects the way of triac supervision.

- 0 = Disabled, no supervision
- 1 = indicates **SSr** by alarm
- 2 = indicates **SSr** by alarm and turns the main relay off

All outputs will turn off. The controller may go on heating only after restart after the triac was changed.

5.4.17 FAH-parameter (Fahrenheit-indication)



Indication: 0, 1

This parameter indicates the setting for °F of the unit.

0 : °C
1 : °F

(see DIP-switch)

PROCESS VALUE (X)



☀ °F
☀ °C

An LED beside the actual value (here 229) indicates always the type of temperature measuring.

5.4.18 Brake-parameter (Overheat-brake)



→ ID-Level: 2
Input limits: 1...20
Default value: 2

This parameter sets an additional brake for aggressive control loops.

In spite of fast answers to disturbances the brake will prevent overheating during heat up.

1 = Disabled, no brake
2...20 = Brake factor

5.4.19 Std-parameter (Standard parameters)



→ ID-Level: 4
Input limits: 0, 1
Default value: 0

A reset of all settings can be started by this parameter.

1 = Reload the standard parameters

Std is only available by the code.

Reloading standard parameters overwrites all settings by the default values.

The procedure needs more than 5 minutes for all zones, programs and parameters.

PLUS-units have to be separated for reset.

5.4.20 IC-parameter (ID Code)



→ ID-Level: 4
Input limits: 0...999
Default value: 22

A new password will be set here. This password has to be entered when asked to unlock the unit. After the setting of a new password, the unit will be unlocked.

A three-digit entry-code (ID-Code) will be set here. This code unlocks the controller.

IC is only available by the code.

5.4.21 IL-parameter (ID Level)



→ ID-Level: 4
Input limits: 1...3
Default value: 2

The IL-parameter disposes of the level of lock, which inhibits the input of settings.

1 : Only setpoints and operation mode are unlocked.
2 : All parameters are locked
3 : No locking, except level 4

IL is only available by the code.

5.4.22 PC-parameter (Power-Control)



→ ID-Level: 2
Input limits: 0,1
Default value: 0
Indication e.g.: 226 [VAC]

The **PC**-parameter activates the reference-voltage for the balance of the power in manual mode. Constant output rates will be adjusted to constant power output in case of fluctuating net voltage.

0: No settings
1: Detection of the reference-voltage followed by the indication of the value.

A new reference-voltage may be detected by repetition of the setting „1“.

5.4.23 tP1-parameter (Protocol-type 1)



The parameter tP1 defines the type of protocol for the rear-side interface RS485-1.

→ ID-Level:	4	0:	FE3 for MCScontrol, Visual-Fecon, Paracon
Inputs limits:	0...1	1:	special protocol
Default value:	0		

5.4.24 tP2-parameter (Protocol-type 2)



The parameter tP1 defines the type of protocol for the rear-side interface RS485-2.

→ ID-Level:	4	0:	FE3 for MCScontrol, Visual-Fecon, Paracon
Inputs limits:	0...1	1:	special protocol
Default value:	0		

5.4.25 LAn-parameter (Language)



without function

→ ID-Level:	4
Inputs limits:	0...3
Default value:	0

5.4.26 L1-3-parameter (Line-voltage)



These parameters indicate the actual voltage of the referring lines.

→ Only indication [VAC]	1 :	Line 1 for zones 1, 4, 7...
	2 :	Line 2 for zones 2, 5, 8...
	3 :	Line 3 for zones 3, 5, 9...

Failed line-voltage will indicate -U- for these zones.

5.4.27 Fr1-3-parameter (Line-frequency)



These parameters indicate the actual net frequency of the referring lines.

→ Only indication [Hz (cps)]	1 :	Line 1 for zones 1, 4, 7...
	2 :	Line 2 for zones 2, 5, 8...
	3 :	Line 3 for zones 3, 5, 9...

Failed frequency will indicate -U- for these zones.

5.4.28 Date-parameter (date and time)



day

The actual date and time may be indicated and set by these 5 parameters.



month

The settings are only required for additional options.



year



hours











Hours will be set in 24h mode.



minutes


5.5 Zone parameters

Each zone has a set of 32 parameters. Selection and setting of parameters as below:


		Parameters can be reached by the parameter-key. In the parameter-level the zone number and the parameter number are indicated with additional dots.
<div style="text-align: center;"> <small>ZONE</small>  <small>SETPOINT (W)</small>  <small>PROCESS VALUE (X)</small>  </div>	   	<p>The keys beside the zone number select the zone or the parameter.</p> <p>The keys beside the setpoint set the value for the parameter.</p>
		The selected number of the parameter (here 2) appears in the lower display.
		The touch on the parameter-key or any other on the left leaves the parameter level.

The functions of the different parameters are explained in the following.


5.5.1 PARAMETER 1: Lo-Alarm

<small>PROCESS VALUE (X)</small> 	<p>The referring zone will indicate Lo-alarm, when the temperature falls below the value of parameter 1. This will be indicated by flashing „-L-“ alternating with the actual value.</p>
<p>→ ID-Level: 2</p> <p>Input limits: 0...600°C 32...999°F</p> <p>Default value: 0°C</p>	<p>At the same time the alarm-contact switches.</p>


5.5.2 PARAMETER 2: H-Alarm

<small>PROCESS VALUE (X)</small> 	<p>The referring zone will indicate H-alarm, when the temperature reaches the value of parameter 2. This will be indicated by „-H-“ alternating with the actual value.</p>
<p>→ ID-Level: 2</p> <p>Input limits: 0...600°C 32...999°F</p> <p>Default value: 400°C/752°F</p>	<p>The alarm-contact switches and the main relay turns all heaters off. After decrease of the temperature the outputs will be powered again.</p>


5.5.3 PARAMETER 3: Deviation

<small>PROCESS VALUE (X)</small> 	<p>As soon as an actual value will deviate for more than the value of this parameter, the referring zone will indicate deviation. This will be indicated by flashing „dL“ or „dH“ alternating with the actual value.</p>
<p>→ ID-Level: 2</p> <p>Input limits: 1...600 K</p> <p>Default value: 15 K</p>	<p>At the same time the warning-contact switches.</p>

5.5.4 PARAMETER 4: P-gap for heating

<small>PROCESS VALUE (X)</small> 	<p>Parameter 4 allows adjustment of the proportional part of the control loop in percent. That means, that a pure P-controller slowly decreases the output rate proportionally. When the actual value = the setpoint the rate will be reduced to 0%.</p>
<p>→ ID-Level: 2</p> <p>Input limits: 0...100 %</p> <p>Default value: 5 %</p>	<p>for $x_p = 0$: P-part is disabled</p> <p>Settings of this parameter will be adapted after classification.</p>

5.5.5 PARAMETER 5: I-gap for heating

<small>PROCESS VALUE (X)</small> 	<p>Parameter 5 allows to adjust the integral part of the controller in seconds. This component of the controller increases or decreases the output rate with the defined speed according to a possible deviation.</p>
<p>→ ID-Level: 2</p> <p>Input limits: 0...999 s</p> <p>Default value: 80,0 s</p>	<p>for $t_n = 0$: I-part is disabled</p> <p>Settings of this parameter will be adapted after classification.</p>

5.5.6 PARAMETER 6: D-gap for heating

PROCESS VALUE (X)

P. 6.

→ ID-Level: 2
Input limits: 0...999 s
Default value: 16,0 s

Parameter 6 allows to adjust the differential part of the controller. This component of the controller 'brakes' the output rate for the stored time, if the actual value approaches the setpoint with too high speed.

for tv = 0: **D**-part is disabled
Settings of this parameter will be adapted after classification.

5.5.7 PARAMETER 7: Classification of the zone

PROCESS VALUE (X)

P. 7.

→ Indication: 0...9

The type of classification will be indicated by the parameter. Settings are not possible.

5.5.8 PARAMETER 8: Operation mode of the zone

PROCESS VALUE (X)

P. 8.

→ Indication: 0...9

The 3 operation modes are to set by the parameter or by the referring key in the display

0 = OFF
1 = Manual mode
2 = Control mode

5.5.9 PARAMETER 9: Monitor-zone

PROCESS VALUE (X)

P. 9.

→ ID-Level: 2
Input limits: 0...2
Default value: 0

This parameter enables to select a zone for controller purpose or for simple indication. A Monitor-zone will be excepted from the group. Monitor-zones can be used for supervision by the settings of parameters 1-3.

Deviations are only available when the setpoint >0°C/32°F.

0 : controller
1 : monitor-zones will be used for simple indication, when no outputs are available or no heater is connected.
2 : Manual power mode for this zone, when no inputs are available at the controller.
However a sensor will enable a control mode without confirmation after change to manual mod (see Auto-Power **AP**).

The cursor-LED flashes in the total display when a monitor zone is selected.

5.5.10 PARAMETER 10: Alternative zone

PROCESS VALUE (X)

P. 10.

→ ID-Level: 2
Input limits: 1...128
Default value: 0

This parameter enables to select an alternative channel for the Auto-Power mode **AP=4**.

The number of the referring zone will be set here after **AC=?** It is available for the next case of a broken sensor.

0 or this zone: no preset
1..128: this zone delivers the output rate in case of a broken sensor.

The input limit for PLUS-units is the total number of zones. In case of changes of variations of the PLUS-unit, this parameter will be reset to "0".

5.5.11 PARAMETER 11: Softstart

PROCESS VALUE (X)

P. 11.

→ ID-Level: 2
Input limits: 0...3
Default value: 1

The unit is provided with a softstart-routine for smooth heating.

This may be enabled or disabled here.

0 : this zone without softstart
1 : this zone with softstart

A quickstart with occasional overheating is available for tasks with very inert control loops

2 : this zone without softstart, with quickstart
3 : this zone with softstart and quickstart

5.5.12 PARAMETER 12: Combined heating

PROCESS VALUE (X)

P. 12.

→ ID-Level: 2
Input limits: 0...8
Default value: 1

The unit is provided with a sequential combined heating function. This zone may be set to a sequence or disabled from the combined heating.

0 : this zone is not combined
1..8: this zone is combined

The sequences will be heated from 8 to 1 in order.

The preferred heated zones have to be set to higher numbers.

5.5.13 PARAMETER 13: Ramp up

PROCESS VALUE (X)

P. 13.

→ ID-Level: 2
Input limits: 0...[1°/1s]
Default value: 0

EA consistent slow heating following a ramp, can be activated here.

The function may be reached only, if the installed heater power is sufficient.

The combined heating is not active in this case.

5.5.14 PARAMETER 14: Ramp down

PROCESS VALUE (X)

P. 14.

→ ID-Level: 2
Input limits: 0...[1°/1s]
Default value: 0

EA consistent slow cooling following a ramp can be activated here.

The function may be reached only, if the installed cooling system is sufficient.

5.5.15 PARAMETER 15: Output rate maximum

PROCESS VALUE (X)

P. 15.

→ ID-Level: 2
Input limits: 0...100 %
Default value: 100 %

This parameter limits the maximum output rate of the heaters.

5.5.16 PARAMETER 16: Output rate nominal

PROCESS VALUE (X)

P. 16.

→ ID-Level: 2
Input limits: 0...100 %
Default value: 100 %

The output rate for Auto-Power function (**AP**-parameter=3) must be set here. This parameter does not influence the controlled mode.

If this zone has already operated in manual mode, the output rate was set here for proposal for the next change to manual mode.

5.5.17 PARAMETER 17: Output rate mean

PROCESS VALUE (X)

P. 17.

→ Indication: 0...100 %
0% after start

This parameter will define itself during **normal control mode**. It stores the long period average of the output rate during the control mode.

The value will be set only 2 min after controlling within the tolerance range (parameter 3).

5.5.18 PARAMETER 18: Output rate mean nominal

PROCESS VALUE (X)

P. 18.

→ ID-Level: 2
Input limits: 0...100 %
Default value: 0

This nominal setting will be compared to the actual mean rate (parameter 17).

Deviations will be indicated by **dy**

0: no output rate-supervision
> 0: this value will get supervised

(see output rate-supervision)

5.5.19 PARAMETER 19: Output rate mean tolerance

PROCESS VALUE (X)

P.19.

The tolerance for the output rate deviation (parameter 18) has to be set here. Within the tolerance range no warning **dY** will be indicated.

→ ID-Level: 2
 Input limits: 0...100 % (see parameter 18)
 Default value: 0

5.5.20 PARAMETER 20: Nominal current

PROCESS VALUE (X)

P.20.

The nominal value of the current of this heater may be set here for supervision of the tolerance range of parameter 21.

→ ID-Level: 2
 Input limits: 0,0... 0: no heater current supervision
 25,0 A > 0: this value will get supervised
 Default value: 0,0 A

5.5.21 PARAMETER 21: Current tolerance

PROCESS VALUE (X)

P.21.

The tolerance for supervision of heater current (parameter 20) has to be set here. The current will be supervised by the tolerance range of parameter 21.

→ ID-Level: 2
 Input limits: 0,0..16,0A
 Default value: 0,5 A

5.5.22 PARAMETER 22: Diagnosis time

PROCESS VALUE (X)

P.22.

Independent of the internal determined value the duration of the diagnosis may be set here to the heat up for 5K/ 9°F.

→ ID-Level: 2
 Input limits: 0...600 s
 Default value: 0 s

5.5.23 PARAMETER 23: Offset Temperature

PROCESS VALUE (X)

P.23.

This parameter will shift the temperature indication of this zone. The actual temperature and the setpoint will be calculated with the referring offset against the real temperature.

→ ID-Level: 4
 Input limits: -99 / 100 K
 Default value: 0 K

5.5.24 PARAMETER 24: Zero cross / phase control

PROCESS VALUE (X)

P.24.

The output may be controlled by pulspackets or phasecut or a dynamic mix of both. The selections are:

→ ID-Level: 2
 Input limits: 0...2
 Default value: 0

0 : Pulspackets
 1 : Phasecut
 2 : Mixed

5.5.25 PARAMETER 25: Boost-Offset

PROCESS VALUE (X)

P.25.

The increase of temperature during the boost-stage has to be set here by relative values.

→ ID-Level: 2
 Input limits: 0...50 K
 Default value: 0 K

5.5.26 PARAMETER 26: Standby-temperature

PROCESS VALUE (X)

P.2.6

The decrease in temperature for standby has to be set here by absolute values.

- ID-Level: 2
- Input limits: 0...300°C
32...573°F
- Default value: 0°C/32°F

5.5.27 PARAMETER 27: Auto-adaption

PROCESS VALUE (X)

P.2.7

Without function

5.5.28 PARAMETER 28-30: Reserve

PROCESS VALUE (X)

P.2.8

Without function

5.5.29 PARAMETER 31: Number of group 1-8

PROCESS VALUE (X)

P.3.1

This parameter assembles this zone to a group. The referring number of the group has to be set here. Groups may be set collectively.

- ID-Level: 2
- Input limits: 0...8 (see groups)
- Default value: 1

5.5.30 PARAMETER 32: Leakage current

PROCESS VALUE (X)

P.3.2

The actual sum of the leakage current of the referring line will be indicated here.

- Indication: 0...mA

6 Configuration of the unit

6.1 Commissioning

The description for commissioning of the unit is anticipated here. If the below listed steps will be carried out in the described sequence, a failsafe function of the Z 1240/... unit is guaranteed.

For better understanding of the different functions we recommend to read this manual.

6.1.1 Dip-switch

There is a 8-fold DIP-switch on the processor module.

Switch	Position	Function
1	ON = °F OFF = °C	Here the temperature indication may be set from °C to °F. The conversion of all programs and parameters needs some minutes after restart.
2	ON OFF	<p>The logic of the digital input No. 5 may get inverted here.</p> <ul style="list-style-type: none"> ■ Passive: The outputs of the controller will be disabled by a 24VDC signal. ■ Active: The outputs of the controller depend on the enable by a 24VDC signal. <p>With disabled outputs the controller will not get started by the menu-key. A temporary disabling will not generally reset this start mode.</p>

The controller has to be turned off before removal of the module as well as before change.

6.1.2 Jumper


There is a block of 2x5 jumpers on the processor module. The default settings are marked.

Jumper	Position	Function
1 - 2	1 = REP NC	Warn-contact failsafe, OK = closed
	2 = REP NO	Warn-contact for lamp/horn, OK = open
3 - 4	3 = AL NC	Alarm-contact failsafe, OK = closed
	4 = AL NO	Alarm-contact for lamp/horn, OK = open
5 - 6	5 = Gn-Lo	Green LED-stripe damped.
	6 = Gn-Hi	GreenLED-stripe bright.
7 - 8	7 = Ye-Lo	Yellow LED-stripe damped.
	9 = Ye-Hi	Yellow LED-stripe bright.
9 - 10	9 = Rd-Lo	Red LED-stripe damped.
	10 = Rd-Hi	Red LED-stripe bright.

The controller has to be turned off before removal of the module as well as before change.

6.1.3 Connection

- Check the mains supply conditions. The terminals inside the controller have to be linked either for star/Y-net with neutral (3x400VAC + N + PE) or for triangle-net (3x230VAC + PE). The referring specification will be delivered with the unit.
- Connection of all heater and sensor cables.
- A signaller may be connected by the alarm/warning-contact of the unit.

 **ATTENTION!** Take care of the maximum load of the contacts (see technical data).

- Connection of external digital signals and interface for computer control, if required.
- Connection to the 3phase mains supply.

The pin assignment has to be taken from the table inside the controller.

6.1.4 Heat-up

- Turn ON the unit.
- Set setpoints.
- Switch the outputs ON.
- After classification the zones rise to the setpoint temperature. The relevant features like softstart, combined heating, leakage current supervision and dry out are enabled. These functions may be disabled.

6.1.5 Finalisation

- Define password and identification level. To inhibit unauthorised operation the password (**IC**-parameter) may be changed. For this reason the level of identification (**IL**-Parameter) may be changed.

7 Technology

7.1 Cable carrier

At the rear side of the display of units greater than **Z 1240/36 x 16** there are 2 cable holders to pull out. These are provided for the supply cable.

7.2 Document case

On top of units greater than **Z 1240/36 x 16** there is a document case below the cover. This may be used for a notebook. There is a cable entry in the rear wall.

7.3 Power fuses

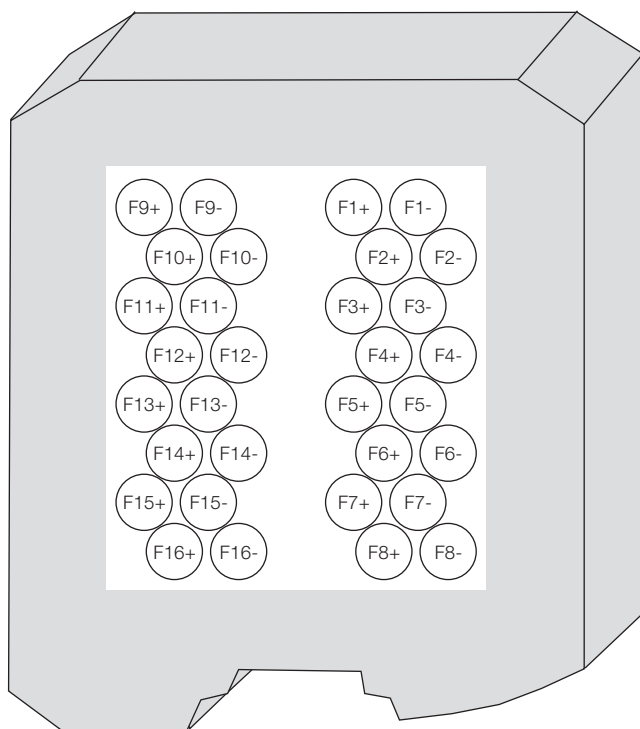
The fuses for the outputs are to find on both sides of the units. The fuses must comply to the quality FF. The strength of the fuses may vary referring to the fitting.

The standard is **16 A FF**.

7.4 Protection against net-voltage

The units of the Z 1240/... series are fitted with a fuse module to protect against net-voltage (NSS-module). These modules protect the sensitive electronics for the sensor-inputs against unacceptable high voltage. Such voltage may occur by mixed wiring or by defective heaters.

As soon as a voltage higher than 6V is put to the inputs of the NSS-module, the internal fast fuses will blow. The voltage will be contacted to the ground. The controller will indicate a broken sensor for this zone.



The referring zone will be reset after replacement of the fuses. These are special fuses, which are plugged on the specially designed NSS-module. The user may replace by himself.

There are spare fuses inside the original Z 1240/... unit.

To change the fuses the front connectors of the referring module have to be unplugged.

Then the module may be released. The cover at the side shows the position of the different fuses. After lifting off the cover the fuses may get changed.

The cover has to be tightened before replacing the module.

7.5 Rear side

At the rear side of the controllers there are the connectors for sensors and heaters, the supply for an operation monitor, the data interface, the digital inputs 2 sockets for an optional signaller (top) and the dry contacts (bottom).

7.5.1 5.5.1 Digital inputs

The unit is fitted with 8 digital inputs. These may be used for remote change of the programs 1...6. A short impulse (min. 100 ms) at the digital input activates the referring program.
A continuous signal at the digital input inhibits the change of programs by the keys or via interface.

(For assignment of the 15-pin plug see below)

Via Digit-in Standby the controller may be set to standby mode. This stage will be finished by a program-signal or the referring key.

Via Digit-in On/Off all outputs are disabled for the duration of the signal. The powered input *):
(see below for the logic of the signals depending on DIP-switch 2 = ON)

- disables all outputs.
- disables the start key for ON.
- erases the LED near the start key.

With the end of the signal the previous status returns.

The inputs are compatible to PLC-voltage of 13..30 VDC at a typical consumption of ca. 8,5 mA.

*) may be inverted by
DIP-switch 2

Contact	Function		
1	Program No.1	Digit-In P1	+ 24 VDC
2	Program No.3	Digit-In P3	+ 24 VDC
3	Disable / Enable outputs *)	Digit-In On/Off	+ 24 VDC
4	Standby / no Standby *)	Digit-In Standby	+ 24 VDC
5			
6 - 8			0 V
9	Program No.2	Digit-In P2	+ 24 VDC
10	Program No.4	Digit-In P4	+ 24 VDC
11	Program No.5	Digit-In P5	+ 24 VDC
12	Program No.6	Digit-In P6	+ 24 VDC
13 - 15			0 V

Logic of the signals at DIP-switch 2 = ON

In this position the controller may be used without external enable On/Off.

„EIN“																								
Digit-In On/Off																								
Digit-In Stdbby																								
Digit-In P1	P1																							
Digit-In Pn	P2																							
→ Leistung	0	0	0	1	0	0	1	1	1	1	1	1	1	0	0	1	1	1	0	0	0	0	0	0
→ Standby	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0

Logic of the signals at DIP-switch 2 = OFF

In this position the remote operation will be failsafe.
There is no output without enable by On/Off. For normal operation without standby there are 2 signals required.

„EIN“																								
Digit-In On/Off																								
Digit-In Stdbby																								
Digit-In P1	P1																							
Digit-In Pn	P2																							
→ Leistung	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	1	1	1	0	0	0	0	0
→ Standby	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	0

7.5.2 Warning- and alarm-contacts

The Z1240/... units are fitted with 2 alarm-contacts. The dry contacts for warning and alarm are available via socket at the rear side. The function may be inverted (see jumper). The control voltage 230VAC is also available at this socket for the supply of external signalers. The voltage may be switched by the dry contacts.

Warning-contact

The warning-contact sets a warning, which informs the operator that the process is disturbed. An immediate action of the operator is not absolutely necessary.

The dry contact is available at pin 1 and pin 3 of the socket at the rear side. The contact is normally closed (NC).

The contact will be activated together with the yellow LED-stripe with one of the following warnings:

- broken sensor (only if AP-parameter = 1, 2, 3,4)
- positive temperature deviation
- negative temperature deviation
- current deviation
- leakage current depending on the setting
- deviation of output supervision
- separation of PLUS-units.

Alarm-contact

The alarm-contact sets a main alarm, which requires the action of the operator. This dry contact is available at pin 4 and pin 5 of the socket at the rear side. The contact is normally closed (NC)

The alarm-contact will be activated together with the red LED-stripe with one of the following alarms:

- broken sensor (only if AP-parameter = 0)
- shorted sensor
- Triac-supervision alarm
- leakage current alarm
- absolute high temperature (H-alarm)
- absolute low temperature (L-alarm)
- overriding of the HH-parameter (HH-alarm)
- leakage current depending on the setting
- separation of PLUS-units.

Warning-alarm-contact socket

Function
see jumper



Contact	Function	Not powered
1.+3.	Warning-contact	NC
4.+5.	Alarm-contact	NC
6.	Output power	230VAC/4A
7.		N

7.5.3 Interface socket

Hint of interface
address

Contact	Function
2	RS 485
3	RS 485

If several controllers Z1240/... are connected to a single monitor, the addressing (see **Adr**-Parameter) has to start by "1" and must be numbered consecutive.

The Baud-rate for the data transmission has to be adapted by the **bAu**-Parameter, if necessary.

7.5.4 Signal-light socket

This socket is designed for an external signal light to be activated together with the functions of the LED-stripe.



Contact	Function	
1	Warning (yellow)	230VAC
2	Alarm (red)	230VAC
3		N

7.5.5 Power supply socket

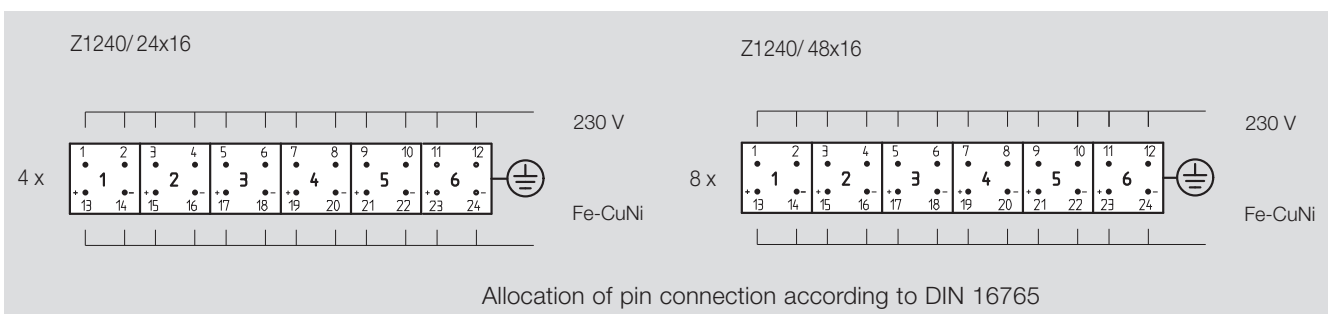


Contact	Function
1	N
2	L
PE	PE

This socket is designed for the net supply of a monitor.

7.5.6 Pin assignment

The following examples are valid for the basic version of the Z 1240/... units.
Units with specified rear boards are not mentioned here.
Specified lists are to find inside the units.

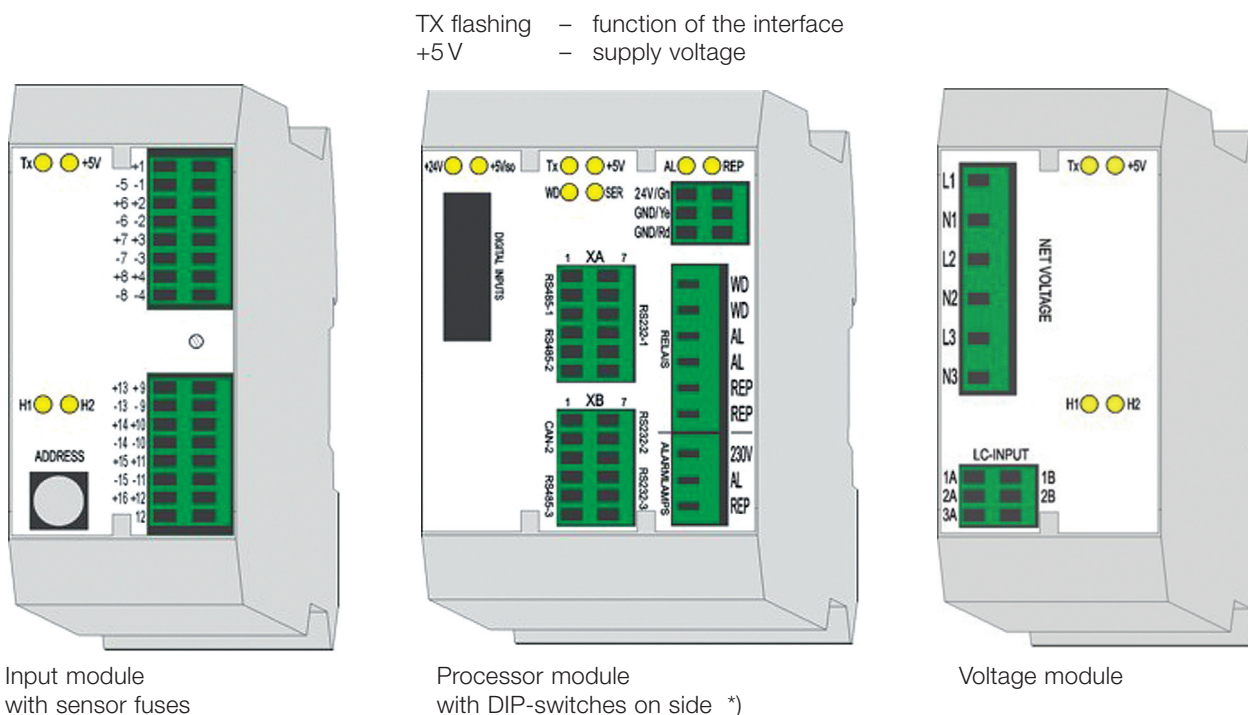


7.6 Controllers

The controllers inside the units are differently designed. Depending on the number of zones Z 1240/... operates a system of one single or multiple processors.

7.6.1 Control units 36 x 16 - 96 x 16

The modules are mounted inside the unit onto a rail, that includes the interface connection.
The LED in front indicate the status, e.g.



*) The input modules have to be set to previous address in case of exchange.

7.6.1 Control units 2 x 16 - 32 x 16

The compact internal board includes all functions of greater Z 1240/... .
The jumpers and DIP-switches are to find on this board bearing the same functions.
These units may be opened by the cover after loosening the 2 screws below the display frame.

8 Technical Data

Control voltage	Selectable Operating voltage Tolerance for peaks	3 x 190 - 400 VAC, N, PE / 3 x 110 - 230 VAC, PE + 5% / - 15% + 15%
Power consumption	Without output	max. 70 W
Net-fuses	Control voltage electronics Control voltage internal power outputs	1 x 0,8A medium inert (5 x 20mm) 1 x 4A medium inert (6,3 x 32 mm) each 16 A super fast (6,3 x 32 mm)
Thermocouple-inputs	Fe-CuNi Typ J Temperature deviation by cable-resistors Temperature compensation Accuracy Temperature actualisation	0...700°C / 999°F Depending on length and wire diameter internal ± 0,25 K 4 x 128 / second
Controller-outputs	Bistable, electrical isolated per zone Reaction of controller Current per zone Attention: Take care of the max. load of the supply cables ! Minimum load	1x heating, 230V contact 10ms at 50 Hz max. 16 A (standard) 100 W
Collective alarm outputs (Relay-contacts)	Functions: max. voltage max. current	1 x alarm-contact 1 x warning-contact 250 VAC 4 A at $\cos \phi = 1$ 2 A at $\cos \phi = 0,5$
Control routines	PI, PD or PID with control-parameters to set for all zones	
Data memory (EEPROM)	Data storage	min. 10 years
Serial interface	isolated RS485, Protocol CAN-Bus	FE3-Bus version 3.03
Ambient conditions	Operation temperature Protection Cooling Surface temperature of the unit Storage temperature Humidity	0...50°C / 32...122°F IP 20 max. 55°C / 131°F - 25...+75°C / - 13...167°F < 95% rel. humidity, no dew-drop
Dimensions B x H x T [mm] Weight	2 - 8 control zones 240 x 210 x 370 10 - 16 control zones 400 x 210 x 370 20 - 32 control zones 450 x 280 x 430 36 - 64 control zones 500 x 800 x 500 68 - 96 control zones 500 x 1000 x 500	12 kg 16 kg 25 kg 75 kg 90 kg

8.1 Hints to EMC

Interference transmissions:	The unit is relieved according to EN 55011 /B (interference transmissions).	
Level of acceptance:	Reliability class	Z2
VDE 0839 Part 10	Ambient class	S2, I4, E3
Suppression:	Ambient class	3
VDE 0843 Part 2,3,4	Degree of strength	3, with external filter 4
IEC 801 Part 2,4,5		

8.2 5.2Delta net

The Z 1240/... controllers may be supplied by a 220/230V Delta-net, if necessary. For that purpose the links at the terminal strip inside the units have to be moved to another position. The drawing with the correct positions is to find with the technical documents.

8.2.1 safety hints

The supply from a triangle net without neutral wire „N“ has to comply with the local regulations for the installation of electrical equipment.

Z 1240/... controllers are basically fit with one fuse to protect against short in the load circuit and against short of one line to PE. In option, there is an additional fuse per zone inside the unit to protect for triangle supply even the 2nd line against short to PE. Retrofitting is possible.

The parameters for H and HH alarm limits should be generally adjusted to the production requirements, to prevent faulty heating.

Z 1225/... connecting cables and Z 1227/... connecting housings are to be used for the electrical connections (power and thermocouple connections) between control unit and the tool. This will ensure optimum controlling accuracy.

The control units are matched to the HASCO range of standard elements. No guarantee can be given for trouble-free functioning if components from other companies are used.

The Z 1225/... power/signal cables must be regularly checked for mechanical damage and replaced as necessary.

The devices must be located such that sufficient ventilation and cooling is available.

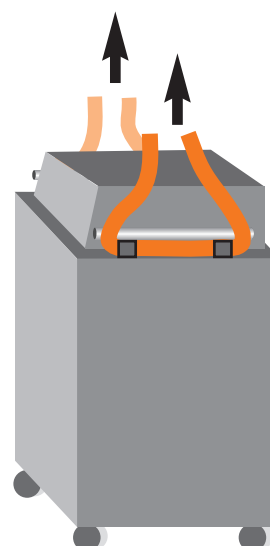
The controllers must be protected from moisture and wet.

The devices must be applied in a technically meaningful way.

Unplug the unit when changing the fuse.

9 Transport (from Z 1240/36 x 16)

The handles at each side may be used as shown in the drawing to lift the controller with appropriate ropes.



EC - Standards

Declaration of EC-Conformity

EC standards referring design, production and distribution.

The precondition is the conventional use of the product as well as the consideration of start up.

If product or accessory will be modified without our agreement, this declaration is invalid.

Description of product:	Multi-hot runner control unit
Type name:	Z 1240/...
Standards:	2004/108/EG EC-Standard Electromagnetic Tolerance 2006/95/EG EC-Standard Electrical Appliance
Applied standards: (as far as applicable)	EN 60204 Teil 1 (Electrical equipment for machinery) EN 61000-6-1 (EMC immunity) EN 61000-6-3 (EMC radiation)



Mag. Christoph Ehrlich
Chief Executive Officer



André Kabbert
Executive Vice President

Lüdenscheid, november 2011